

User's manual

V300+ / V600+ / V1000+ Version N°2.0 - E







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1. Description of the instrument

- Handwheel allowing the displacement of the measuring probe.
- 2. Locking device to activate the fine ajustment.
- 3. Fine adjustment screw.
- 4. Switch to acivate the air cushion. (Version **C**)
- 5. Handle allowing the displacement of the instrument.
- 6. Measuring probe.
- 7. Screw to adjust the measuring pressure (0.7N-1.6N, ajustable) (wrench /2mm)
- 8. Lever for fast displacement.
- 9. Screw for locking the measuring carriage (wrench 2mm) (**Screw, chromium- plated**)
- 10. Control screw to ajust the floating probe suspension. (wrench 2mm)
- 11. Bracket for printer.
- 12. Printer RS 232.
- 13. RS 232 connector.
- 14. Green light = Indicates the trickle charge with AC adapter connected.
- 15. Red light = Indicates fast charging.
- 16. Connector for AC adaptor or data transmission foot pedal.
- 17. **Green** light = normal measuring mode.
- 18. **Orange** light = measuring diameters.
- 19. **Yellow** light = measuring centerlines.
- 20. **NORMAL** or **DIAMETER/CENTERLINE** mode key.
- 21. **PRESET** key = set the display at zero or memorizes preset values.
- 22. **PRINT** key = RS232 data output.
- 23. **ON-OFF** key = ON / OFF Switch.
- 24. Numerical keyboard.
- 25. **CLEAR** key = reinitialises the minimum/maximum/delta memories.
- 26. **MIN/MAX/DELTA** mode key.
- 27. **MM/INCH** key, true conversion Metric Inch Metric.
- 28. **REF I / REF II** selection key.
- 29. Resolution key. (0.010/0.001mm or .0005/.00005")
- 30. Probe constant key.

2. Display functions

- 31. Indication of sending data.
- 32. Indication of **DELTA** mode.
- 33. Indication of **MAX** mode.
- 34. Indication of **MIN** mode.
- 35. Indication of **REFII** mode.
- 36. Indication of low battery level connect the AC adaptor.
- 37. Indication of measuring values.
- 38. Indication of **MM** mode.
- 39. Indication of **INCH** mode.
- 40. Indication of measuring direction.
- 41. Indication of centerline mode.
- 42. Indication of diameter mode.
- 43. Indication of **PRESET** mode.
- 44. Indication of **CONSTANT** mode.
- 45. Indication of keyboard locked.



3. Distintive characteristics

The V300,V600 and V1000 are height measuring instruments, self-contained, controlled by a microprocessor.

- Easy to operate.
- o Self-contained operation for a period of: without air cushion : max.100h.

: with air cushion : max. 50h.

- o Rechargeable battery.
- Big display.
- Acceptance of measured values by an acoustic signal.

4. Specifications

Designation	V300	V300C	V600	V600C	V1000	V1000C
Measuring range	300 mm or 12"		600 mm or 24"		1000 mm or 40"	
Application range	535 mm or 21"		835 mm or 32.8"		1235 mi	m or 48.6"
Resolution		0.01 mn	n / 0.001 mn	n or .0005"/	.00005"	
Overal measuring accuracy	3 µm	+ (L(mm)/300	$= \mu m \text{ or } .00$)012" + (L(ir	nch)/300000)	= inch
Repeatability		=	± 2 s = ≥ 2 μ	um or .00008	3"	
Max. displacement speed of the measuring carriage	3m/120" per second					
Measuring pressure	0.7 N − 1,6 N (adjustable)					
Measuring system	differencial capacitance Sylvac (patented)					
Power supply		Batt	attery powered (rechargeable)			
Operational time	100 h.	50 h.	100 h.	50 h.	100 h.	50 h.
Squareness deviation overal (in measuring direction)	5μm or .0002"		8 µm or .0003"		12 μm or .00047"	
Data output	RS 232 C					
Operational temperature limit	+ 10 °C to +40°C or 50° F to 104° F		104° F			
Total height	565 mm or 22.2"		865 mm or 34"		1275 mm or 50"	
Weight	10 kg		12,3 kg		15,3 kg	

5. Delivery

The TRIMOS V300, V600 and V1000 are supplied as follows:

- o Ruby ball probe dia. 4 mm (**V-1**)
- Hex screwdriver wrench 2 mm (T016-INB.2), Hex screwdriver wrench 2,5 mm (T016-INB.3)
- AC adaptor set 8.5V / 700mA sector, depending on country.
- Dust cover.
- o Test and guarantee certificates, user's manual.

Vertical automatic	Code number	Code number
	without air cushion	with air cushion
Measuring range 300mm /12", 220 V	V300/220	V300C/220
Measuring range 300mm /12", 240 V	V300/240	V300C/240
Measuring range 300mm /12", 110 V	V300/110	V300C/110
Measuring range 300mm /12", 100 V	V300/100	V300C/100
Measuring range 600mm /24", 220 V	V600/220	V600C/220
Measuring range 600mm /24", 240 V	V600/240	V600C/240
Measuring range 600mm /24", 110 V	V600/110	V600C/110
Measuring range 600mm /24", 100 V	V600/100	V600C/100
Measuring range 1000mm /40", 220 V	V1000/220	V1000C/220
Measuring range 1000mm /40", 240V	V1000/240	V1000C/240
Measuring range 1000mm /40", 110 V	V1000/110	V1000C/110
Measuring range 1000mm /40", 100 V	V1000/100	V1000C/100

Options : see optional accessories (page 22-26)



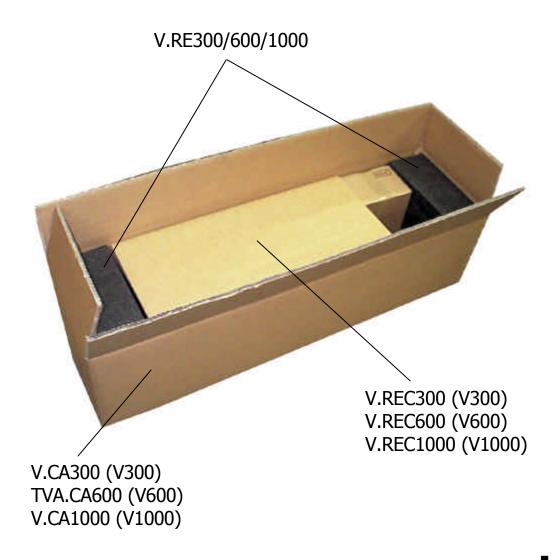


6. Unpacking and installation

The V300, V600 and V1000 are supplied in a shock prof box. The instrument itseff is surrounded with a protection cover.

- To unpack the instrument lay the box in a horizontal position, Brand name visible on top, open it and take the instrument out carefully.
- Take off the protection cover.
- Insert the ruby ball (V-1).
- Unlock completely the transport safety screw (9), Screw, chromium-plated.
- Clean the instrument, especially the three point air bearings on the base.
 DO NOT USE CHEMICAL PRODUCTS.
- Place the instrument on a granite surface table.

FOR FUTURE TRANSPORT KEEP THE ORIGINAL PACKING.





7. Getting started

The instrument stands on a granite surface table (or e.i. cast Iron table)

- Switch **ON** the instrument by pressing the key (**ON**).

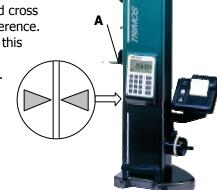


- The display will show



- The reference of the column must be taken :

- Move the probe (**A**) slowly and cross the two arrows to take the reference. This operation will memorized this reference point improve the accuracy of the instrument.



The display will begin to count.
 If during this operation the display doesn't count.
 restart the operation again.



- If the indicator (**36**) showing complete battery discharge, connect the AC adaptor. The instrument remains opérational.



Complete recharging takes **15 hours**.

 It will not do any harm by connecting the AC adaptor continiously, because it will charge the instrument with a maintenance power.

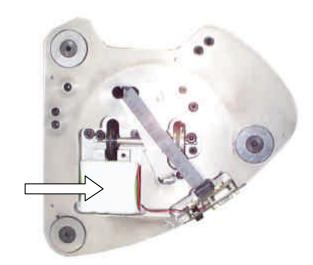
IT IS NOT NECESSARY TO WAIT FOR THE INSTRUMENT TO BE FULLY CHARGED BEFORE USE:
INSTRUMENT CAN BE USED DURING CHARGE CYCLE.



8. REPLACING THE BATTERY PACK

As sson as the autonomy of the instrument becomes unsufficient, the battery pack should be changed.(**Lifespan about 4 to 6 years**)

- 1. Purchase a battery pack from your TRIMOS distributor.
- 2. Switch off the instrument.
- 3. Place the instrument in an horizontal position onto a table. (steady)
- 4. Unscrew the base plate. (5 screws)
- 5. Disconnect the battery pack (A)
- 6. Connect the new battery pack and refit the base plate. Take care not to damage Any connecting cables.
- 7. Charge the new battery pack ~15 heures.



Battery pack Code number 151-331.009



9. Adjusting the measuring pressure

DO NOT ADJUST UNLESS IT IS REQUIRED!

Tools to be used

- 1 Hex screwdriver wrench (2 mm)
- 1 Dynamomètre (force gage) 0 300 grs
- The adjustment screw (**7**) is situated at the left side of the column, inside on the measuring carriage.
- The measuring pressure is factory set at approx. 1 N.
- By turning this adjustment screw **anticlockwise**, the measuring pressure will be **decreased**.(2 turns = ~0.1N)
- By turning this adjustment screw **clockwise**, the measuring pressure will be **increased**. (2 turns = ~0.1N)
- The measuring pressure range is :

min: 0.7N - max: 1,6N.

How to adjust?

- Measure the dynamometer until the acoustic signal ring.
- Read the dynamometer (e.i. : 100 grs).

 To be more accurate, measure by using the fine adjustment.



10. Adjustment of the floating probe suspension

DO NOT ADJUST UNLESS IT IS REQUIRED!

Tools to be used

- 1 Hex screwdriver wrench (2mm)
- 1 Dynamometer (force gage) 0 − 300 grs.
- The adjustment screw (**10**) is situated on the left side of the column, inside on the measuring carriage.
- If the measuring pressure is higher in the upwards direction (probe too heavy), turn the control screw anticlockwise. (1 turn = ~10 grs.)
- If the measuring pressure is higher in the downwards direction (probe too light), turn the control screw clockwise. (1 turn = ~10grs.)
- The TRIMOS probes weights about ~25grs, the probe suspension could be adjusted upto a probe of 150grs.

How to adjust?

- Measure the dynamometer until the acoustic signal ring.
- 1. (from bottom to top)
- Read the dynamometer (e.i.: 100 grs)
- 2. (from top to bottom)
- Read the dynamometer (e.i.: 102 grs)
- The measuring pressure has to be equal in both directions.





11. Main functions



Switches the instrument **ON** or **OFF**.



Sending data RS232, only when measuring. ((See page 18) for other settings)



Set the display at zero or memorizes preset values.



Normal key mode, **green** light **on**, measuring heights of normal and Reversed surfaces. (The probe constant must have been previously entered to measure reversed surfaces.

Ø, key mode, **orange** light **on**, measuring diameter (takes account of probe constant).

Measures internal or ecternal diameters in any sequences.

- \oplus , key mode, **yellow** light **on**, displays the centerline. Comes after the diameter display, as soon as :
- the probe is released or
- the Normal, $\varnothing \oplus$ key is pressed.



Displays the probe value. Return to measuring mode without change : press any key.

- Measuring the constant : one measurement on each side of the setting gauge (see page 13).



Changes the display resolution : 0.001mm <-> 0.01mm

or : .00005 " <-> .0005 "



Direct conversion of mm <-> inches.



Reinitialises the maximum, minimum and delta memories.



Change of reference mode (REFI / REFII)



Modes: Minimum -> Maximum -> Delta



12. Secondary functions



Memorizing a preselected value : Press **Preset** key (long pressure on the key ~2 sec.)





Introduce a preselected value from the numerical Keyboard.





Confirm the preselected value by pressing again The **PRESET** key. The preselected value is memorized.

0123.000

(A second preselected value can be memorized on **REF II** mode.)

Initialization functions:



To lock or unlock the conversion: switch the instrument On while pressing the mm/in key.

Instrument previously initialized in mm.

Locking the **In** conversion:

Instrument **OFF**, hold down **mm/in** key when switching **ON** the instrument.

(To unlock the conversion repeat the opération).



Instrument previously initialized in Inch.

Locking the **mm** conversion:

Instrument **OFF**, hold down **mm/in** key when switching **ON** the instrument.

(To unlock the conversion repeat the opération).



13. How to start up?

13.1 Setting the probe constant.

To measure reversed surfaces, or diameters. the instrument takes account of the probe constant, i.e. the diameter of the ball and its deflection.

The **green** light comes on when the probe comes into contact with the part being measured.





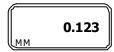
1. Switch **ON** the instrument, then press



Move the probe across the two arrows to initialize the column reference (see page 8)







2. Memorizing the constant: press



kev



- 3. Touch surface (P1) (green light ON)
- 4. Touch surface (P2) (green light ON)
- 5. Release the probe. The probe constant is memorized for future measures.



Attention:

The probe constant must be reset after changing probe or after moving the probe position.

13.2 Measuring heights

Taking the reference : Touch the reference plane ($\bf P1$), the **green** light is $\bf ON$.

1. Press **PRESET** key quickly (>1 sec.)



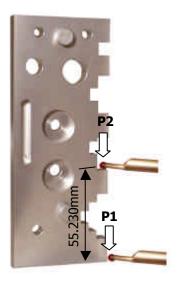
Set the display at zero, or memorizes **PRESET** value.

Measuring height: Touch surface (**P2**), the **green** light is **ON**. The value is displayed.





55.230



| 💩 | TRIMOS |

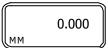
13.3 Measuring diameters and centerlines.

The probe constant value should already have been memorized: (see page 13)

1. **Normal** mode, if necessary press



key, lights **OFF**

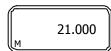


2. Touch the reference plane (P1)





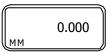
green light ON



3. Press **PRESET** key quickly (>1 sec.), to set the display at zero.



Realise the probe.



4. Change to **Diameter/Centerline** mode by pressing

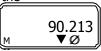




key, **orange** light blink.



5. Place the probe inside the bore to be measured and touch a point (**P2**) which is well away from the reversal point.



6. Move the part or the instrument sideways to the probe. The reversal point is memorized.



7. Touch a point (P3) well away from reversal point.



8. Move the part or the instrument sideways to the probe. The diameter is displayed as well as the Ø symbol.



- 9. Displaying the centerline can be done in 2 ways:
 - 1. by releasing the probe.



(no possibility to ask again measured diameter)

2. by pressing the key (Yellow light ON)

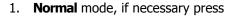


The centerline is displayed, as well as the

symbol.



13.4 Measuring with min and max mode.





Key (lights **OFF**)



2. Touch the reference plane (**P1**)



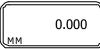
(green light ON)



3. Press **PRESET** key quickly (>1 sec.) to set the display at zero.



key



4. Place the probe inside the groove to be measured and touch a point (P2) which is well away from the reversal point.

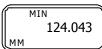
5. Press MIN/MAX key to MIN



MIN 125.231 MM

6. Move the part or the instrument sideways to the probe. The reversal point is memorized.

The first value is displayed.



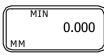
.993

.043

7. Press PRESET key to set the reversal point at zero.



key



8. Press MIN/MAX key to MAX



MAX 0.320

 Place the probe inside the groove to be measured and touch a point (P3) which is well away from the reversal point.

76.686

10. Move the part or the instrument sideways to the probe. The reversal point is memorized.

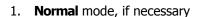
The second value is displayed.





P2

13.5 Measuring with Delta mode





Key (lights OFF)

2. Touch the reference plane (**P1**)

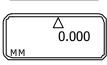


102.678

3. Delta mode, press MIN/MAX key to \triangle

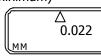


(Press 3 times the key) (MIN, MAX, DELTA)



4. Move the part or the instrument sideways to the point

Delta is memorized. (Delta = maximum-minimum)



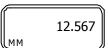
13.6 Measuring of squareness.

- 1. Use a lever dial indicator and clamp it into the holder (A).
- 2. Adjust the lever dial indicator against the surface to be measured. Set the lever dial indicator to zero.
- 3. **Normal** mode, if necessary press





Key (lights OFF)



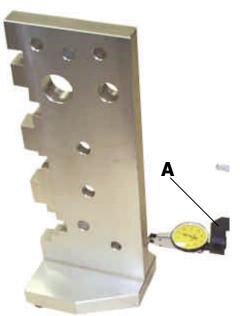
4. Press



Key, to set the display at zero.

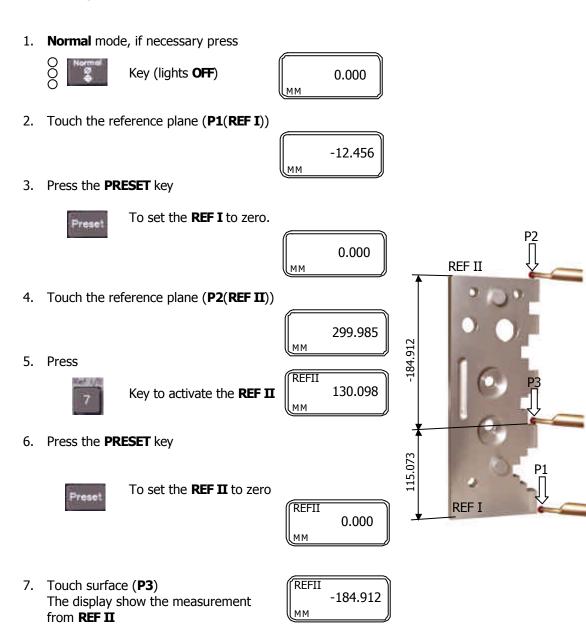


- 5. Move the lever dial indicator along the surface to be measured.
- 6. Read the lever dial indicator for squareness value and digital display for the height displacement value.

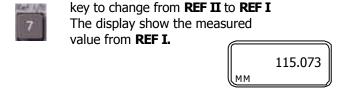




13.7 Measuring with two references



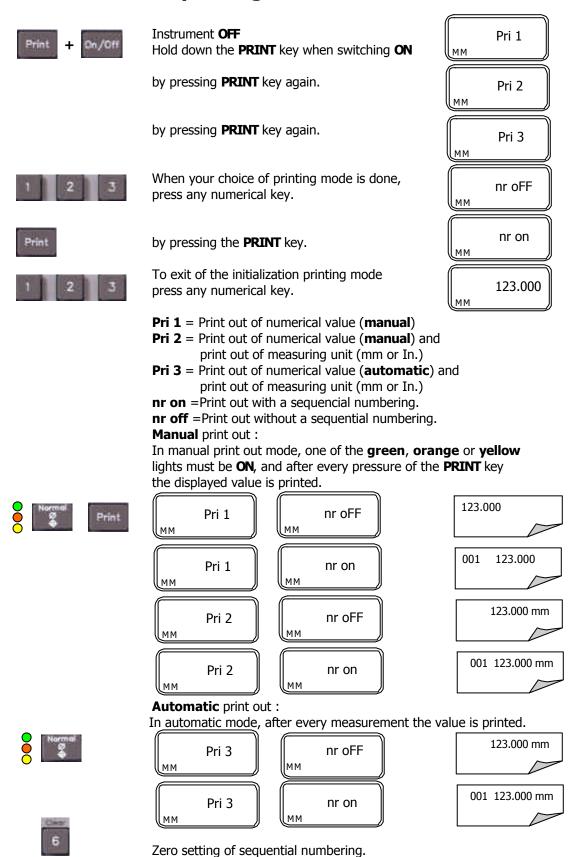
8. Press



Note:

In **REF I** the display show the measured value only. In **REF II** the display show the measured value and **REF II**.

14. Initialization of printing mode



15. Printer

<u>Introduction</u>

The thermal printer V-30 is compact and light weight, equiped with an RS232C serial interface via a 9 –way D-type connector (female).

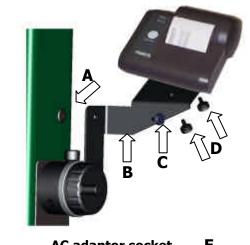
It is powered from internal Ni-Cd batteries.

Material required:

Printer with AC adaptor (**V30/**), Bracket (**V32**), connecting cable (**V-31**), paper rolls (**V-30.7**).

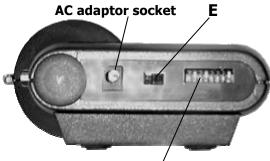
Assembling printer on V300, V600, V1000.

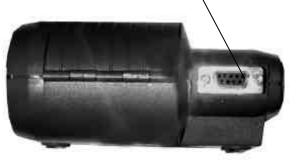
Lock the bracket (B) with the screw (C) into the thread (A),
 Fixe the printer by two screws (D), connect the RS232 cable (V-31),
 Switch ON the printer by the button. (E).



9-wav	D-type	socket	(female)

- 1. No connection
- 2.TXD (Transmit data to host)
- 3.RXD (Received data from host)
- 4. No connection
- 5. **GND** (Signal ground)
- 6. No connection
- 7. No connection
- 8. CTS (Clear to send)
- 9. No connection





Designation	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
24 characters per line	ON							
48 characters per line	OFF							
Software hanshake		ON						
Hardware hanshake		OFF						
7 Data bits, Even parity			ON					
8 Data bits, No parity			OFF					
1200 Baud				ON				
4800 Baud				OFF				
Normal height					ON			
Double height					OFF			
Normal width						ON		
Double width						OFF		
Normal/Dual ply							ON	
Labels							OFF	
Auto wake up disabled								ON
Auto wake up enabled								OFF



16. AC adaptor, external contact

If the indicator (**36**) showing complete discharge is displayed, connect the AC adaptor. The instrument remain operational. Complete recharding takes 15 hours. A foot pedal may be connected to the external contact (**16**) for data transfer. Another functions may be assigned to it.. (see page 21)

17. RS232C connector

The RS 232 C port (**13**) is OptoRS compatible (see OptoRS convention for more informations). It allows connection to a printer to protocol the measurement results or to a computer. The latter may remotely control all the instrument functions.

Female 9 – pins D-Sub connector (seen from the outside):



Pin 1 : +9V output if charger connected or

+9V input from external supply.

Pin 2 : **RXD** = Data output of the instrument.

Pin 3 : **TXD** = Data input from the PC

Pin 5 : **SG** = signal ground.

Data transmission format : 4800 bps, 7 bits, parité paire, 2 stop bits.

The value is sent in ASCII code:

in mm: **SIGN 10** 2 **10** 1 **10** 0 **DP 10** $^{-1}$ **10** $^{-2}$ **10** $^{-3}$ **R**

Comments: -10 -3 only for 0.001mm resolution.

-10 2 and 10 1 = spaces if they are zero.

- There is no space between minus sign and the first numeral
- The + sign is replaced by a space.

in in : SIGN 10 1 10 0 DP 10 $^{-1}$ 10 $^{-2}$ 10 $^{-3}$ 10 $^{-4}$ 10 $^{-6}$ R

Comments: -10⁻⁵only for .00005 inch resolution.

 -10^{1} = space if zero

- There is no space between minus sign and the first numeral.
- The + sign is replaced by a space.



18. Remote control of the instrument

The instrument functions are controlled externally by an ASCII code corresponding to the 3 first letters of the function. Spaces are removed. The message may be in upper or lower case. The question mark? implies an instrument response.

? or **PRI** (**PRI**nt) requests displayed value.

CLE (**CLE**ar) reinitialises the maximum / minimum / delta memories.

Code for external functions. (foot-pedal)

EXT1 external contact = data transmission **EXT2** external contact = display preset

EXT3 external contact = normal mode <-> diameter mode **EXT4** external contact = reference mode 1 <-> mode reference 2

EXT? asks for current function of external contact.

Other codes

ID ?(identification) Instrument replies : SYLVAC TRIMOS V600

IN (Inch) display unit MM (MilliMètre) display unit

KEY0 (KEYboard) keyboard locked keyboard unlocked

CEN (**CEN**terline) centerline mode diameter mode

DEL (**DEL**ta) delta mode (maximum-minimum)

NOR (NORmal) normal mode MAX (MAXimum) maximum mode MIN (MINimum) minimum mode

MOD ? (MODe) interrogation of the measuring mode :NOR,DIA,CEN,MIN,MAX,DEL

PRE (**PRE**set) displays the preset value. **PRE** + nombre memorises a new preset value.

PRE? interrogates the memorised preset value.

RES3 Resolution 0.001mm - .00005 in Resolution 0.01mm - .0005 in

SET ? (SETting) interrogation of general parameters :

MM/IN RES2/3 REF1/2 KEY 0/1 B0/1. B0=battery recharging.

UNI ? (UNIt) measuring unit : MM or IN

VER ? (VERsion) instrument program version : **V 1.1 24.01.00**

DIS .. (**DIS**play) access to display i.e.: DIS1500.236 = displayed 1500.236

DISOFF exit of access display mode.



Setting/reference gauge, H = 75mm **V75** Setting/reference gauge, H = 3 in. **V75E**

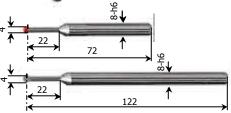


Setting/reference gauge, H = 300 mm**V-300M** Setting/reference gauge, H = 12 in. **V-300E**



Ruby-ball probe (standard), Ø 4mm V-1

Tungsten-carbide ball probe, Ø 4mm V-1.4/L120



Swivel holder V-2
Swivel holder V-2E



Swivel holder V-2/D8/L150

Swivel holder V-2/D4/L150



Measuring insert with V-3 Interchangeable pin.

30° holder V-4

Reduction holder 8mm/4mm V-5

200 SE

Measuring insert with interchangeable pin.

V-6/L200



Extension probe holder

Fast locking device for measuring probe.

V-20

V-7/H100

0001

wooden accessories support **V-60** (without accessory)

Touche de mesure à tige interchangeable

TVA 4

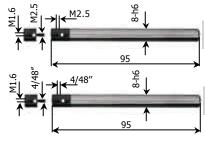
99

Holder TVA5.1 and Probe holder TVA5.2

TVA 5M

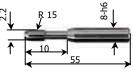
Holder TVA5.1 and Probe holder TVA5.2E

TVA 5E



Barrel-shapped insert (M3-M16)

TVA 9.1



Barrel-shapped insert (M6-M48)

TVA 9.2



Barrel-shapped insert (M12-M150)

TVA 9.3

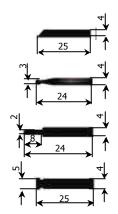


V	7.	1
	V	V 7.

Ball insert TV 7.2

Pin shaped insert **TV 7.3**

Disc shaped insert TV 7.4



Complete set (set N°1) including:	V-51
Ruby-ball probe Ø 2mm, L=87mm	V-50.9
Holder (V-50.12.1) and	V-50.12
probe Ø 1mm (V-50.12.2)	
Cylindrical probe Ø 3mm, L=89mm	V-50.11
Knife-edge insert L= 89mm	V-50.10
Locking key for probe	V-50.13
Hex screw wrench 1,5mm	V-50.14
Hex screw wrench 2,5mm	V-50C
Wooden case	V-50C



Complete set (set N°2)	V-50
including:	
Ruby-ball probe Ø 2mm, L=87mm	V-50.9
Holder (V-50.12.1) and	V-50.12
probe Ø 1mm (V-50.12.2)	
Cylindrical probe Ø 3mm, L=89mm	V-50.11
Knife-edge insert L= 89mm	V-50.10
Holder L=124mm	V-50.5
Holder L=80mm	V-50.6
Ball probe Ø 2mm/M2,5	V-50.4
Disc shaped insert	V-50.2
1mm/M2,5 (V-50.2.2), 0,8mm/M2,5	
(V-50.2.1).	
Corner insert 1mm/M2.5	V-50.3
Ruby-ball probe 3mm/M2,5	V-50.1
Holder à 90°/M2,5 L=85mm	V-50.7
Holder à 90°/Ø 4mm L=85	V-50.8
Locking key for probe	V-50.13
Hex screw wrench 1,5mm	V-50.14
Hex screw wrench 2,5mm	V-50.15
Wooden case	V-50C





Printer including: V-30/110US
Printer (V30.0) and AC adaptor
(without bracket, without cable) V-30/240/GB



Bracket including 3 screws V-32



RS 232C cable V -> printer V-31



RS 232C cable V -> PC CABL.RS.1/1-9P



Thermal Paper rools (5 pcs) V-30.7



AC adaptor for printer V30/...

AC adaptor 110V/US	V-30.1/110US
AC adaptor 220V/Europe	V-30.1/220
AC adaptor 240V/GB	V-30.1/240GB



AC adaptor for V300/600/1000

AC adaptor 100V/JA	V-100
AC adaptor 120V/US	V-110
AC adaptor 220V/Europe	V-220
AC adaptor 240V/GB	V-240



Dust cover:

Dust cover for V300	V.HO300
Dust cover for V600	V.HO600
Dust cover for V1000	V.HO1000





20. Maintenance

Remember that it is a measuring instrument? Take care of it.

21. Transport

For re-packing, use the original packing or adequate packing. Protect the instrument by a slipcover. Do not put accessories close to the instrument.

22. Complaints / Repairs

In case of breakdown, contact the distributor of TRIMOS immediately. Repairs can only be considered if the instrument is sent to us in a clean condition and Packed according to our instructions.

« The guarantee is only valid if verified by our agent ».



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